

Webinar Will Begin Momentarily

TODAY'S AGENDA:

- Welcome
- Speaker Introduction
- Presentation
- Q&A
- Closing



Professional Education Series

Support. Inform. Educate. Empower.

Plant-Based Nutrition for Diabetes: Evidence-Based Strategies for Better Management



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Plant Based Nutrition for Diabetes

Evidence-Based Strategies for Better Management

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Disclosures

Consultant to PepsiCo, Orgain, United Soybean Board, and Heartland Food Products Group, maker of Splenda® Brand Products. She is a former independent contractor to Califia Farms, General Mills, Impossible Foods, USA Pulses, USA Pears, Sanofi, Florida Orange Juice, the Tomato Wellness Council, and the Alliance for Food and Farming.



Learning Objectives

After this presentation, attendees will be able to...

- Recognize the health benefits of plant-based diets in the context of diabetes management.
- Identify whole foods and ingredients that support glycemic control and overall metabolic health.
- Learn strategies to address common challenges and nutritional needs when adopting a plant-based diet for managing diabetes.



The Global and U.S. Impact of Diabetes

Global Diabetes Burden

- 537 million adults worldwide have diabetes (IDF, 2021)
- 783 million people may have diabetes by 2045
- Diabetes costs the global healthcare system \$966 billion annually

Diabetes in the U.S. (CDC Nov 2024)

- Prevalence: Nearly 1 in 6 adults in the U.S. have diabetes
- Undiagnosed Cases: 4.5% of adults have diabetes but don't know it.
- Prediabetes: 100 million+ Americans have prediabetes
- Who's Most Affected?

Men vs Women, By Age, By Weight



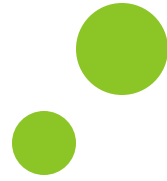
The Role of Nutrition in Diabetes Management

Poor diet remains a leading risk factor for chronic disease, contributing to nearly 1 in 5 deaths globally (The Lancet 2022)

Key Dietary Risks for Diabetes:

- High sodium intake
- Low whole grain intake
- Low fruit intake
- People consuming a plant-predominant diet had a 34% lower risk of type 2 diabetes
- Whole-food, fiber-rich diets improve insulin sensitivity and blood sugar control more effectively than traditional low-fat diets
- Higher plant protein intake is linked to better metabolic health and lower diabetes rates





What is a Plant-Based Diet?

- What does it mean?
- What are the key benefits?
- Global Trends





How Plant-Based Diets Affect Diabetes

Core Benefits of Plant-Based Diets for Diabetes:

High Fiber Content

Low Glycemic Index

Anti-Inflammatory Properties

Effects on Diabetes Management:

Improved Insulin Sensitivity: High fiber and anti-inflammatory foods support better insulin response.

Reduced HbA1c Levels: Studies report an HbA1c reduction of **0.5%–1.5%** for those adopting a plant-based diet (*JAMA*, 2019).

- Even modest reductions in HbA1c can significantly lower diabetes complications.

Mechanisms of Insulin Sensitivity in Plant-Based Diet

Factor	Plant-Based Diet Effect	Mechanism
Insulin Sensitivity	✔ Improves	↑ GLP-1, SCFA production, reduced lipotoxicity
Glucose Control	✔ More stable blood sugar	High fiber slows glucose absorption
Inflammation	✔ Decreases	Phytochemicals & polyphenols reduce oxidative stress
Weight Management	✔ Supports healthy BMI	High fiber promotes satiety & reduces calorie density

Weickert, M. O., & Pfeiffer, A. F. (2018). Impact of dietary fiber consumption on insulin resistance and the prevention of type 2 diabetes. *The Journal of Clinical Endocrinology & Metabolism*

Reynolds, A. N., et al. (2020). Dietary fiber intake and glycemic control in type 2 diabetes. *BMJ*.

Zeng, Z., Chen, M., Liu, Y., Zhou, Y., Liu, H., Wang, S., & Ji, Y. (2025). Role of *Akkermansia muciniphila* in insulin resistance. *Journal of Gastroenterology & Hepatology*, 40(1), 19-32.

<https://doi.org/10.1111/jgh.16747>. Epub 2024 Oct 13. PMID: 39396929.

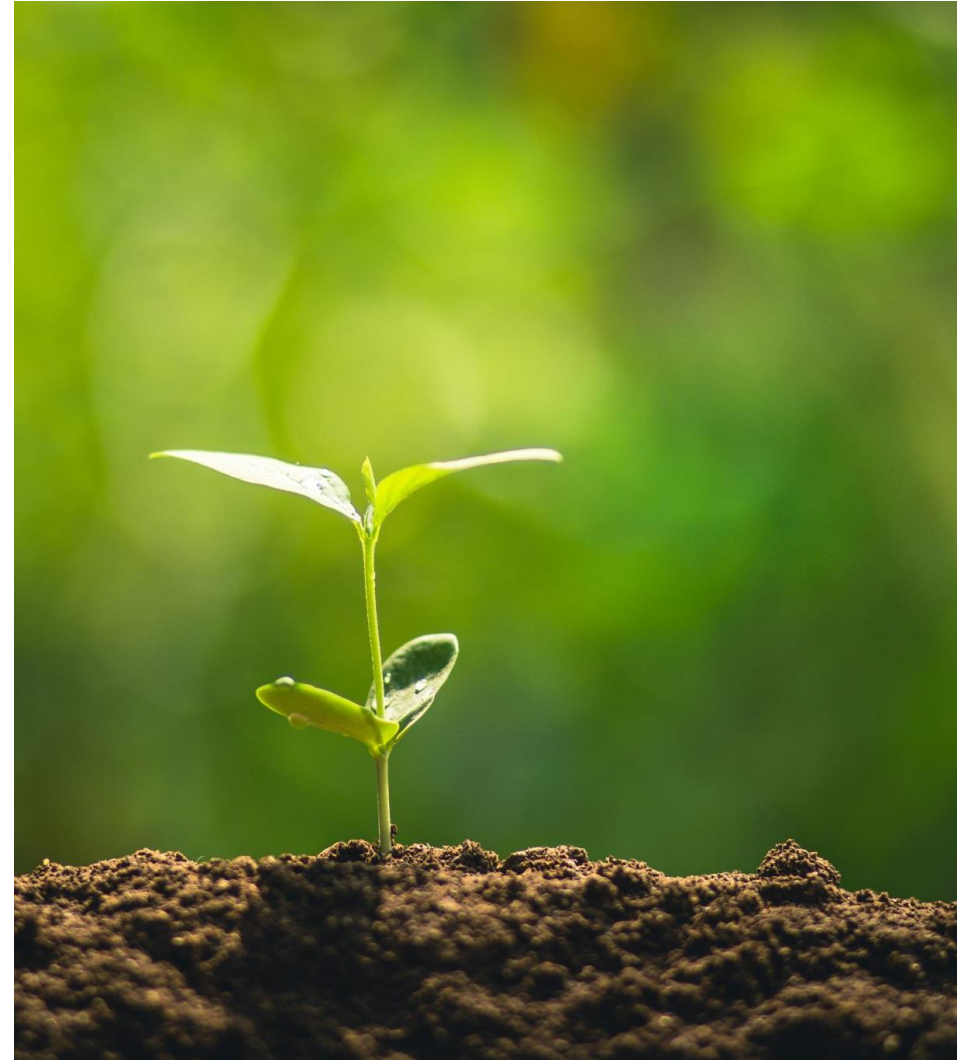
Galgani, J., Uauy, R., Aguirre, C., & Diaz, E. (2008). Effect of dietary fat quality on insulin sensitivity. *The British Journal of Nutrition*, 100(3), 471-479. <https://doi.org/10.1017/S0007114508894408>.

Barnard, N. D., et al. (2006). A low-fat vegan diet improves glycemic control and cardiovascular risk factors. *Diabetes Care*.

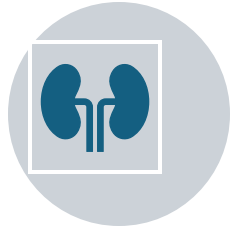
CGM Data - How Plant-Based Eating Affects Blood Sugar

 **CGM data comparing glucose response to:**

- High-fat keto meal (delayed glucose spike)
- Refined-carb meal (sharp spike & drop)
- Whole-food, plant-based meal (smooth, steady curve)



Success Story – Plant Based Diet & Type 1 Diabetes



Betty with **Type 1 diabetes** (over 40 years) switched to a whole-food, plant-based diet after a heart attack.



Weight & Well-Being

Energy Levels: ↑

Weight Loss: ↓ 20+ pounds

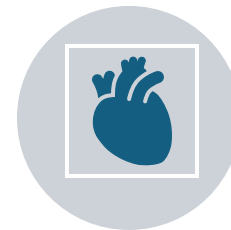


Glycemic & Metabolic Improvements:

Insulin Use: ↓

A1c ↓ Below

CGM Data: ↓ fluctuations,
improved TIR



Cardiovascular Health

Cholesterol: ↓ 257 to 115

Triglycerides: ↓ 154 to 94

↓ Inflammation Markers

↓ Reduced CVD Risk



Case Study – Prediabetes in Remission with a Plant-Based Diet

52-year-old man with **prediabetes**, switched from a standard diet to a **plant-focused, high-fiber diet**

- **Results:**
 - **HbA1c dropped from 5.9% to 5.3%.**
 - **Lost 18 lbs without calorie restriction.**
 - **CGM showed fewer glucose spikes.**

Addressing Common Myths & Challenges

 Myth	 Reality
Plant-based diets are too high in carbs and will spike blood sugar	Whole, fiber-rich plant foods slow glucose absorption , leading to better blood sugar stability (<i>Weickert & Pfeiffer, 2018</i>)
You can't get enough protein on a plant-based diet	Legumes, tofu, quinoa, nuts, and seeds provide all essential amino acids needed for health (Mariotti, F., & Gardner, C. D. 2019).
Plant-based diets lack essential nutrients like B12, iron, and omega-3s	B12 supplements, fortified foods, and strategic meal planning ensure adequate intake (<i>Melina et al., 2016</i>).
Plant-based diets are too restrictive and hard to follow	There are many flexible options , and studies show plant-based diets are often easier to sustain than calorie-restricted diets (<i>Kahleova et al., 2024</i>).



Adventist Health Study

Vegetarians in the Adventist Health Study showed a **62% lower prevalence of diabetes** than non-vegetarians, highlighting the protective role of a plant-based diet.



Orlich MJ, Fraser GE. Vegetarian diets in the Adventist Health Study 2: a review of initial published findings. *Am J Clin Nutr.* 2014 Jul;100 Suppl 1(1):353S-8S. doi: 10.3945/ajcn.113.071233. Epub 2014 Jun 4. PMID: 24898223; PMCID: PMC4144107.



EPIC-Oxford Study

Key Findings

Diet Group	Diabetes Risk Reduction	Adjustment for BMI
Meat Eaters	Baseline (Higher Risk)	-
Vegetarians	35% Lower Risk	11% after BMI adjustment
Vegans	47% Lower Risk	1% after BMI adjustment

Lower BMI in vegetarians and vegans largely explains their reduced diabetes risk compared to meat-eaters.

BROAD Study: Benefits of a Whole-Food, Plant-Based Diet



Study Highlights



Average Weight Loss: **11.5 kg (25.3 lbs)** over 1 year



No Calorie Restriction or Exercise Required



Health Benefits



Medication Reduction: 29% decrease in usage



Quality of Life: Improved with a 9 cm reduction in waist size



Implications



Effective, low-cost approach for weight loss and health improvement, recommended for hospitals and health settings



Plant-Based Nutrition for Diabetes Management

Research Highlights

- Plant-based diets significantly **reduce type 2 diabetes risk**
- For those with diabetes, benefits include:
 - ✓ Better Weight Control
 - ✓ Improved Blood Sugar and Lipids
 - ✓ Lower Blood Pressure
 - ✓ Reduced Risk of Heart and Vascular Complications

Provider Takeaway

Healthcare providers can feel confident recommending plant-based eating



Plant-Based Nutrition for Diabetes Management

Health Benefit	Plant-Based Diet	Standard Diet
HbA1C	0.4% lower	Minimal Change
Weight Loss	Significant (5%+)	Moderate
Insulin Sensitivity	Improved	No major impact
Cardiovascular Health	Lower LDL, BP	No consistent change

Broader Impact: Evidence suggests vegan and vegetarian diets may help lower LDL cholesterol in those with cardiometabolic risks.



Whole Food, Plant Based Diet

Definition

- Emphasizes whole, unprocessed plant foods
- Includes fruits, vegetables, whole grains, legumes, and nuts
- Excludes refined foods and animal products

Key Benefits

- Improves Blood Sugar
- Reduces Chronic Disease Risk
- Supports Healthy Weight
- Boosts Overall Health

Legumes: A Natural Ally for Blood Sugar Management

Nutrient-Packed: High in fiber, protein, and low-GI carbs

- Types include beans, lentils, chickpeas, and peas

Powerful Health Benefits

- Supports Blood Sugar
- Heart Health
- For Type 2 Diabetes
 - ✓ Better Insulin Response
 - ✓ Easy and Affordable



Studies suggest that legumes can help with glycemic control and may reduce heart disease risk in those with diabetes!

Whole Grains and Diabetes Prevention

What Are Whole Grains?

- They retain the entire grain kernel, providing fiber, vitamins, and minerals

Benefits for Diabetes

-  **Lower Type 2 Diabetes Risk:** Higher whole grain intake is linked to a significantly reduced risk of type 2 diabetes (*BMJ*, 2020)
-  **Steady Blood Sugar:** Whole grains are low-glycemic, offering sustained energy and supporting stable blood sugar

Recommendations

Incorporating whole grains is a key dietary strategy for reducing diabetes risk and promoting overall health



Green Leafy Vegetables and Diabetes Prevention

Nutrient-Dense: High in fiber, vitamins, and minerals essential for stable blood sugar and metabolic health

Examples: Spinach, kale, and broccoli, all low in digestible carbs, ideal for diabetes management

Additional Health Benefits:

Supports Insulin Sensitivity

Boosts Gut Health

Reduces Inflammation & Fights Oxidative Stress

Broccoli: Contains sulforaphane

Vitamin C in Leafy Greens

Improves Heart Health

Adding **1.5 servings** of green leafy vegetables daily can reduce type 2 diabetes risk by **14%** (*BMJ*, 2010)



Healthy Fats for Diabetes & Heart Health

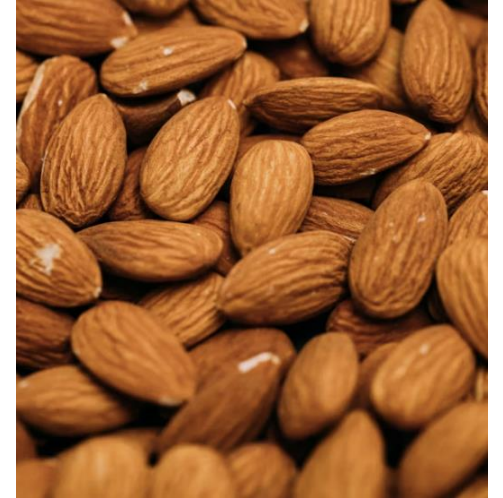
Top Sources of Healthy Fats

- Nuts, Avocado, Seeds

Key Benefits

- Blood Sugar
- Heart Health
- Weight Management

A 2019 study of 16,000 participants found that tree nut consumption was linked to a reduced risk of heart disease and mortality in those with type 2 diabetes (*BMJ*, 2019)



The Role of Avocados and Chia Seeds

Avocados

- Blood Sugar Stability: Low in sugar, high in fiber
- Lower BMI: Linked to reduced diabetes risk (AHS-2, 2019)
- Avocatin B: May help reduce insulin resistance



Chia Seeds

- High Fiber: Prevents blood sugar spikes
- Glycemic Control: Slows digestion
- Heart Benefits: Lowers blood pressure, reduces inflammation



The Gut Microbiota-Insulin Sensitivity Connection

Before Increasing Fiber 🥩 (Low Fiber Diet)	After Increasing Fiber 🥬 (High Fiber Diet)
● Lower microbiome diversity	● Higher microbiome diversity
● Reduced SCFA production	● Increased SCFA (short-chain fatty acids) production
● Higher gut inflammation	● Lower inflammation & improved gut barrier function
● Increased insulin resistance	● Enhanced insulin sensitivity (better glucose uptake)

Spices for Diabetes Support: Cinnamon & Turmeric

Cinnamon

Blood Sugar Control: May reduce fasting blood sugar by **5-29%**

Mechanism: Acts like insulin and aids glucose metabolism

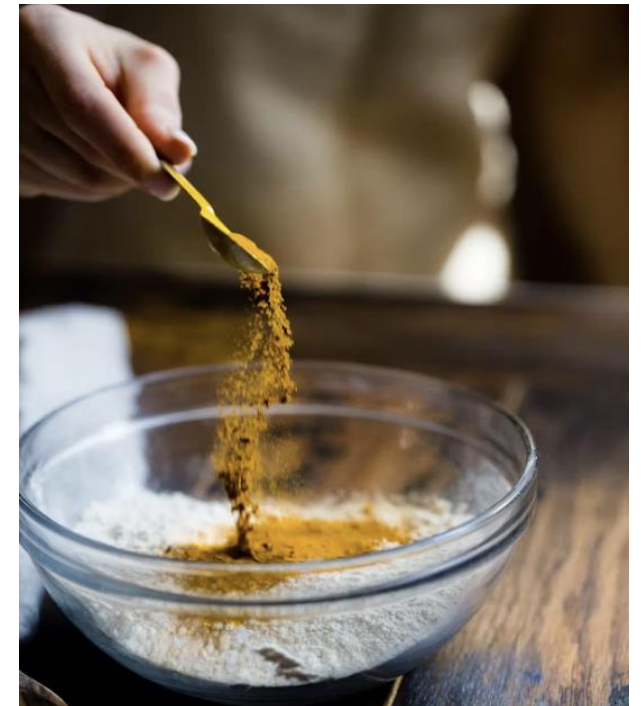
Additional Benefits: Meta-analysis of 13 studies found cinnamon helps lower triglycerides and total cholesterol, supporting heart health (*Kutbi et al., Crit Rev Food Sci Nutr, 2022*)

Turmeric (Curcumin)

Anti-Inflammatory: Reduces oxidative stress and inflammation linked to diabetes

Blood Sugar & Heart Health: Shown to lower blood glucose, HbA1c, and improve cholesterol levels (*Systematic Review, 2022*)

Journal of Evidence-Based Complementary and Alternative Medicine 2022; Systematic Review on Curcumin 2022



Spices for Diabetes Support: Ginger & Fenugreek

Ginger

Improves Insulin Sensitivity: HbA1C (*Huang et al., Medicine, 2019*)

Mechanism: Enhances glucose uptake, reduces oxidative stress, and supports pancreatic beta cells

Additional Benefits: May aid digestion and gut health, supporting metabolic function

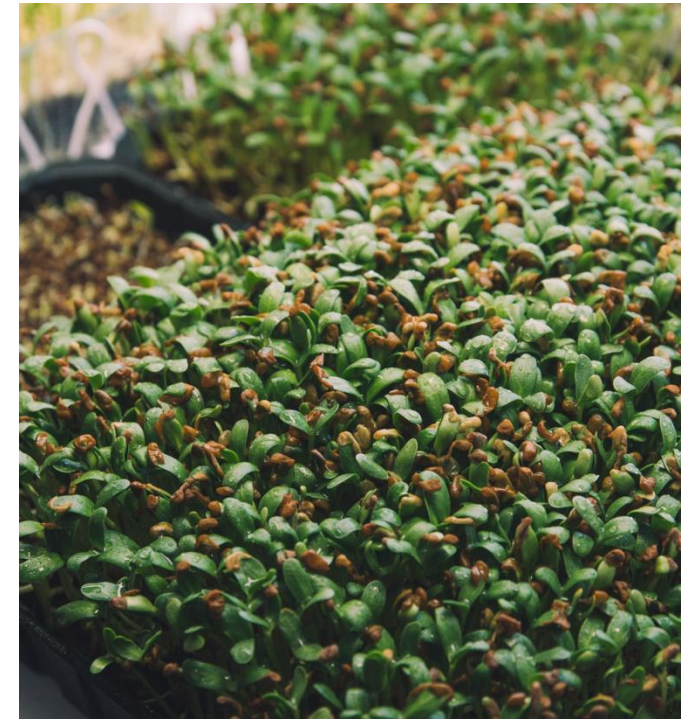


Fenugreek

Reduces Post-Meal Glucose Spikes: Slows carb digestion and absorption

Mechanism: High in soluble fiber and 4-hydroxyisoleucine, stimulates insulin secretion (*Neelakantan et al., Nutr J, 2014*)

Additional Benefits: Supports cholesterol balance and may improve fasting blood sugar levels





Challenges of Plant-Based Diets

Key Barriers

- Affordability
- Accessibility
- Nutrient Gaps

Did You Know?

Only **1 in 10 adults** in the U.S. meets daily fruit and vegetable recommendations (*CDC*)

Why It Matters

Addressing these challenges can make plant-based diets more sustainable and accessible for everyone



Overcoming Barriers to Plant-Based Eating

Strategies for Success

- Fortified Products
- Community Access
- Meal prep Tips

Practical Tips

- Frozen Vegetables: Convenient, affordable, and just as nutritious as fresh
- Buy in Bulk: Saves money and ensures a steady supply of staples like beans, grains, and nuts

Practical Meal Planning for Plant-Based Diabetes Management

Key Components for a Balanced Blood Sugar Friendly Meal

- Fiber-Rich Carbs
- Protein
- Healthy Fats

Simple Meal Ideas

- Quinoa & Veggie Bowl
- Chickpea & Spinach Curry
- Berry & Greens Smoothie



Tip: CGM data can guide personalized food choices, especially carbs for better blood sugar management

Sample Snack Ideas



Edamame



Toast w/nut butter + Figs



Jicama w/Guacamole



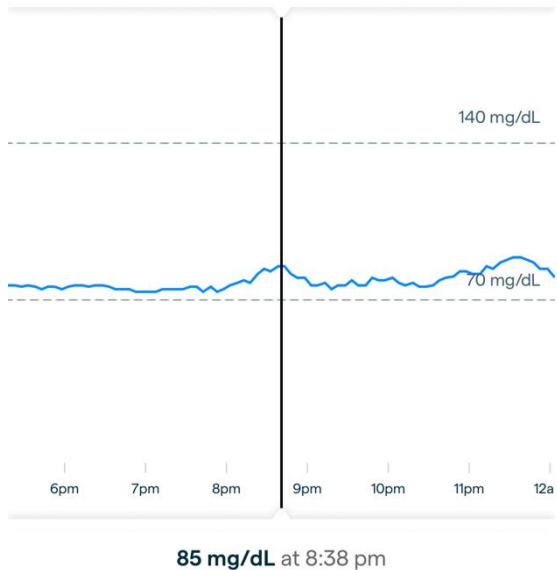
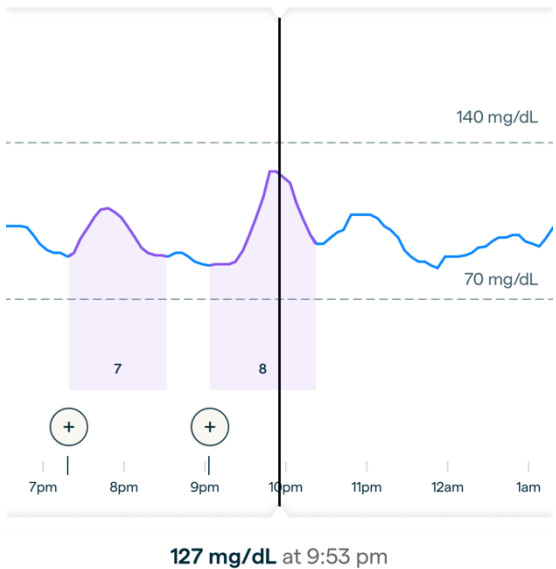
Yogurt Parfait



Pairing fiber-rich carbs with healthy fats/protein blunts glucose spikes and enhances satiety



CGM Data: Apple vs. Apple with Almond Butter



Broader Health Benefits of Plant-Based Diets

Beyond Diabetes

- Supports whole-body health, not just blood sugar management

Weight Management

- **Research Insight:** Linked to lower BMI and improved metabolic health
- High fiber diets improve gut microbiome and insulin sensitivity

Cardiovascular Health

- **Key Finding:** 15% lower risk of cardiovascular disease (*Am J Prev Cardiol*, 2024)
- **Study Highlight:** 25% lower heart disease risk (*J Am Heart Assoc*, 2022)

Anti-Inflammatory Effects

- Rich in antioxidants & polyphenols, reducing inflammation (*Redox Biol*, 2021)

Longevity

- Associated with lower mortality risk and longer lifespan (*Am J Clin Nutr*, 2024)

Actionable Takeaways for Dietitians Using CGM & Plant-Based Eating

✓ Personalize Carb Choices Using CGM Data

Identify **which whole-food carbs minimize glucose spikes** (e.g., lentils vs. quinoa vs. brown rice).

Adjust **portion sizes or food pairings** based on **CGM trends**.

✓ Leverage Resistant Starch for Improved Insulin Sensitivity

Incorporate **cooled & reheated grains, potatoes, and legumes** to lower postprandial glucose response.

Promote **unripe bananas, oats, and lentils** for natural resistant starch benefits.

✓ Optimize Meal Sequencing & Food Order

Encourage clients to **eat fiber and protein first, carbs last** to **flatten glucose curves**.

Studies show that **starting with salad or legumes before rice/pasta** reduces glucose spikes.

✓ Balance Macronutrients for Glycemic Control

Pair carbs with healthy fats & protein (e.g., hummus + whole-grain crackers) to blunt glucose spikes.

Encourage **omega-3-rich sources** (flax, walnuts, chia) for anti-inflammatory benefits.

✓ Monitor Glycemic Variability Instead of Just A1C

CGM reveals **real-time glucose fluctuations**, helping tailor interventions beyond HbA1c.

Educate patients on **"time in range"** as a more useful metric for blood sugar control.



- Improves insulin sensitivity and glycemic control
- Reduces risk of diabetes complications

- Legumes, whole grains, leafy greens, and healthy fats

- **Meal Planning:** Balanced, nutrient-rich meals
- **Accessible Options:** Affordable, diabetes-friendly choices
- **Innovative Products:** Bridging science and real-world application

Plant-based nutrition is a **proven, science-backed tool** for diabetes management, bridging research with real-world impact.





Thank You

Vandana Sheth

RDN, CDCES, FAND



Thank you for your
commitment to advancing
health—let's continue
building a healthier, plant-
powered future together!

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